

Thermal Runaway

Thermal runaway is a key safety issue and a threat to life and property. As more and more EV and hybrid cars are on the road, the need to pay attention to the risk of thermal runaways would require to be heightened. The rise in global temperatures and the inherent combustibility of lithium-ion batteries are something we all have to be aware of. The fact of the matter is that EV fires are quite rare and the battery technology keeps improving over time. As the shift towards electric mobility continues towards the 2050 net zero goal and the need to decarbonize, it is imperative that all roads lead to this direction moving forward. Sustainability is more than just a byword for going green, but it is defined by the United Nations Brundtland Report as the ability to meet our current needs without sacrificing the future generation's ability to meet theirs. Resources are finite and should be conserved to ensure that the equilibrium is maintained and society must be responsible in areas like energy conservation, environmental protection and reduction in air pollution, all of which would sustain us in the years to come. There are six key transformation areas outlined in the 2050 initiative and one of those is the decarbonization of the energy sector. Insulation plays a key part in delivering energy savings and clean energy that is sustainable for the long-term.

The current lithium-ion battery has already progressed by leaps and bounds. It is now much more efficient with higher capacity and its ability to charge at a faster rate means that it is more usable than in previous times. Given the fact that spontaneous ignition is a rare occurrence, it still doesn't dismiss the reality that a very small percentage of EV and hybrid cars can cause problems and issues down the road. Electric fires from lithium batteries are very hard to put out. They are extremely difficult to extinguish as the batteries take a long time to cool down and can re-ignite in the days, weeks or even months after. The salts present in lithium-ion batteries are self-oxidizing which means they can't be starved-out like a typical fire. Damage to properties and infrastructures would be more extensive in the event of a fire caused by lithium batteries putting facilities and infrastructures in greater peril.

Thermal runaway is a spontaneous reaction that occurs within milliseconds as the temperature in the battery cells reach a certain point where the electrolyte is ignited, cathode breaks down due to the heat and in the process release the oxides. As oxygen gets mixed in the activity creating an exothermic reaction that leads to a fire that is almost impossible to extinguish once it has started as it generates its own oxygen that adds to its burning capacity and the intensity of the heat that is outputted. There are various potential causes that can result in thermal runaways of batteries namely overcharging, spike in current while charging or discharging, short circuits and overheating all of which can allow this process to occur. As the lithium battery's energy is very dense, the resulting explosion and fire that occur can be catastrophic in scale and destruction.